

V

THE ROUTINE TREATMENT OF GONORRHŒA AND SYPHILIS

II

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A.—TREATMENT OF SYPHILIS

IN every case of *primary affection*, even where there is merely the faintest suspicion of a lesion, we examine the serum obtained by scraping, if necessary also the serum obtained by suction. If the result is negative, scrapings or the serum obtained by puncture and aspiration of the base of the ulcer or the primary lymphatic glands are also examined for *spirochætes*; in the last resort saline dressings are applied and further examinations made for several days. In women who have been exposed to the danger of infection from syphilis, after gentle scraping, numerous preparations of the cervical and urethral secretions are carefully examined *for spirochætes*.

I treat fresh cases of syphilis with specific methods almost always only after substantiation of the diagnosis.

For the purpose of diagnosis we make use of the dark-ground illumination, and only in special cases do we examine film preparations sent on to us from outside, using the staining methods of Giemsa, and possibly also of Becker, Fontana, etc.

Blood tests are carried out in the serological department of the Clinic (Fräulein Margaret Stern), usually according to Wassermann's original method, with some slight modifications.

The complement we take from guinea-pigs, kept under our own supervision (on the premises), on the afternoon before the examination is made. Three extracts are used, and these we make out of human heart with a small addition of cholesterin. We also regularly use the flocculation method of Sachs Georgi, and in exceptional cases also the Benzockol Reaction, Sachs-Klopstock; the D.M. (or third modification of Meinicke), the Trübungs-Reaction (Dold);

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the *Jacobstal-Gratz* cold fixation method; the auto-amboceptor-refinement of the active serum method with repeated soaking in sheep's blood (M. Stern).

For treatment we use the arsenical preparations neo-salvarsan, and in cases of intolerance or resistance, sodium or silver salvarsan and neo-silver salvarsan; the original salvarsan is used very rarely. In by far the great majority of cases we give neo-salvarsan.

Mercury Preparations. The most generally used before the introduction of the bismuth treatment were:—

Of Injection Preparations, the salicylate, thymol-mercury, calomel, rarely grey oil (mercinol), novasurol and 1 per cent. mercury bichloride solution in saline. Only in special cases do we employ inunction treatment, anointing with unguent. cinereum of the pharmacopœia, or a preparation made with resorbin. Very exceptionally mercury was given internally (yellow iodide of mercury, hydr. oxydu-late, tannate, etc.).

Bismuth.—We now use principally Bismogenol and Spirobismol. Other preparations which we have tried have shown no particular advantages. (Before every injection of mercury or of bismuth a urinary examination must be made, and when albumen appears injections must at once cease).

Iodine.—We use principally potassium and sodium iodide.

Primary Sero-negative Syphilis in a full-grown man of middle weight (women about $\frac{1}{4}$ to $\frac{1}{3}$ less), is treated in the following manner:—

Day.	Neo-sal. intrav.	Bismogenol (1 c.c. = 0.058 Bi) intramuscularly or Spirobismol, 1½ to 2 c.c. = 0.045 to 0.06 Bi.	Hg Salicyl. (10 per cent.) 1 c.c. = 0.05 Hg intramuscularly.
1	0.3	—	—
2	—	0.5–1 c.c. Bismogenol.	0.05 to 0.1 Hg Sal.
4–5	0.45	—	—
6	—	1.0 „	0.1 „
9	—	1.0 „	0.1 „
9–10	0.45	—	—
12–13	—	1.0 „	0.1 „

Note.—Bi and Hg are alternative.

and so on according to tolerance, giving Neo-salvarsan every four to five days (0.45 to 0.6), up to a total dose of

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5.0 to 5.5 grm. Bismogenol, every three to four days (1 c.c.), up to a total dose of 15 to 20 c.c. (0.9 to 1.2 Bi); or spirobismol, 35 to 40 c.c. (1.0 to 1.2 Bi).

With regard to the most commonly used combinations of mercury (much more used formerly), we gave up to the total dose of 12 to 15 c.c. 10 per cent. suspension of mercury salicylate in sterilised ol. amygd. or in vasenol, totalling 0.6 to 0.75 grm. Hg; or 12 to 15 injections of calomel oil, 10 per cent. or 40 per cent. (Zieler's formula), in doses of, on an average, 0.05 calomel, to a total of 0.5 to 0.6 Hg. Occasionally also we started with mercury salicyl. or in the same doses (0.05 to 0.1) thymol-mercury or novasurol (1 to 2 c.c. per injection, an injection every day (0.03 to 0.06 Hg), and at the last we gave some injections of mercinol (0.05 to 0.07 Hg). In the case of patients who were unable to come up for such frequent treatment we used formerly to give neo-salvarsan once a week only (at that time very often 0.6), and on the same day a mercury injection (using, in particular, grey oil, on account of its slower absorption). This was not done so much in the beginning of the cure as in its second half. In the case of patients who have shown themselves to be tolerant towards both preparations we now use the combined bismuth and neo-salvarsan treatment, often so arranged that every four to six days the bismuth and neo-salvarsan injection, are given at the same time. The consequently somewhat longer intervals between the individual bismuth injections have not proved to be harmful.

In Primary Sero-negative Syphilis we invariably give one more course of treatment, which is as strong, or perhaps only about two-thirds as strong, as the first, with an interval of one and a half to two months. If clinically and serologically all is and remains negative, we are satisfied with these two treatments. In these cases iodine is not used.

During the first course of treatment, at the time of the first five to six injections, the blood is regularly examined for the Wassermann reaction. Only those cases are regarded as sero-negative which are consistently negative.

In the case of patients under hospital supervision the cerebrospinal fluid is examined at the beginning and, if possible, also at the end of the first course of treatment.

The blood is examined two to four weeks after the end of the first course of treatment, after the beginning of the

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second, and at the second neo-salvarsan injection of the second course. Should it at any time be found positive, then the case is no longer reckoned among the sero-negative primary cases, but is treated as a sero-positive one.

After the end of the second course of treatment a clinical and serological examination is made, at first, every four to six weeks ; after the first half year, every eight to twelve weeks ; and in the second year, every twelve weeks. The C.S.F. is again examined at the end of the second year. At the end of the first and certainly at the end of the second year, a provocative neo-salvarsan injection of 0.3 or 0.45 is given, and the blood is examined the following day, as well as five days later. Should all this show a negative result, the patient is dismissed at the end of the second year after infection as cured, humanly speaking, but is told that it would be wise to have his blood examined once a year and certainly before marriage. He is also told that he should always inform (even if unasked) any future doctor into whose hands he may come that he has suffered from syphilis.

He is also warned of the possibility of his becoming re-infected. Between *primary syphilis with positive sero-reaction* (even if this was only once positive after a provocative injection) and early *secondary syphilis* I make no difference in treatment. The same treatment is given as in sero-negative primary syphilis, except that, if tolerance is good, the salvarsan doses are somewhat increased.

In these cases two to three months after the second course of treatment follows a third, which, if there is a continued negative finding, can be somewhat weaker than the first, and then after three to four months comes a fourth course of treatment. The examination of the C.S.F. is undertaken, if possible, in these cases at the beginning, or also at the end, of the first course, and in any case at the end of the second year. Provocative injections are given at the end of the first and second, and perhaps also at the end of the third year. Should the blood after the first course of treatment not be negative, the second course will commence at a shorter interval after the first, and the total neo-salvarsan will in these cases be increased still more. Frequently, instead of neo-salvarsan, neo-silver salvarsan is used. Only if all the clinical and serological examinations after the end of the first course have proved persistently negative are we

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satisfied with the above-mentioned four courses. We then follow the patient's clinical and serological history until the end of the third year, and dismiss him after a further favourable period as above mentioned, but in no circumstances sooner than, at the earliest, one to two years after the end of the treatment (also after provocative injections) if everything has been found negative. Should any pathological signs be found, the number of courses is then increased ; and we also attempt by other means, parenteral administration of protein, or by baths, sweating methods, etc., to influence the course of the disease.

Where there is a persistently positive C.S.F. I would make a trial of the malarial treatment.

In the case of later Secondary Syphilis which has not been treated, or has been insufficiently treated, the same procedure is followed, but the number of courses of treatment is increased (to five or six, or more), and the period of observation is longer (about four years, or at any rate two years after the last sign).

In Tertiary Syphilis I differentiate between the simple gummatous or tuberoso affections of the skin, the mucous membrane, and the bones in which the internal organs have, under radiological and C.S.F. examinations, shown themselves thus far to be sound, and the internal and neurological cases.

In the first group the treatment will begin just as in primary sero-negative syphilis, and will probably proceed according to the age of the patient with smaller single doses, and longer pauses.

In addition, pot. iod. or sod. iod. will be given in doses of from 2 to 4 grm. and more per day.

In each case a second, but generally also a third and fourth, course of treatment will be given.

The treatment of disease of internal organs, whether alone or with disease of the skin, mucous membranes, or bones, is varied according to the nature of the organ, the general condition, and the age. Above all, the courses of treatment are begun with smaller doses, and with one of the two anti-syphilitic remedies, preferably now with bismuth, or with bismuth and iodine. After one to two weeks neo-salvarsan is given, at first in doses of 0.15, or possibly still less ; the intervals are also longer at first. Only in those cases where the disease process must be cut short as quickly as possible do we proceed more vigorously

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from the very start, and then more by a shortening of the intervals between the single injections than by increasing the doses. In cases with heart, kidney and liver symptoms we adhere particularly, however, to the above-mentioned doses, though after a considerable time these may reach the full total dose. In diseases of the liver we are most cautious with the salvarsan, and in kidney disease with the bismuth and mercury, laying at the same time great stress in these cases upon the use of iodine and upon the functional treatment of the organ (cardiac remedies, diet for liver diseases, etc.).

The treatment of late syphilis of the internal organs must be very energetic and continued for a long time, because we cannot judge the actual end or course of the syphilitic process, or the presence of recurrences in the same way as we can those affecting the skin, etc.

In latent syphilis the cases which have already been mentioned require no further consideration here: that is, those in which courses are given as continuation to the treatment after there is entire absence of signs.

We must further discriminate between latent syphilis in the narrow sense when clinical, serological, spinal fluid examinations, and no less, of course, radiological examinations, disclose nothing pathological, and "latent" syphilis in which the serum, or spinal fluid, or both, are pathologically changed.

We must also distinguish between the early latent, which occurs in the secondary period (about four years), the late latent, and, finally, those in which the history leaves us as much in the dark as does the clinical investigation. These are, therefore, the cases in which only the blood or C.S.F. examination, or remains of syphilitic disease (such as leukoderma or more or less characteristic scars) point to syphilis. Finally, we must take into consideration such treatment as may have been given in the past.

It is clear that upon such data it is impossible to formulate a scheme of treatment for latent syphilis. I usually proceed in the following manner: Untreated, early latent syphilis, with positive blood or C.S.F. reaction, receives the same treatment as in early syphilis with symptoms, providing that the syphilitic infection is not of longer standing than corresponds to the early secondary period (see treatment of sero-positive syphilis).

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When the blood and C.S.F. reactions are negative in early syphilis the latest possible time of infection compatible with the conditions found is also presumed, but at the same time consideration is given to any former treatment the patient may have had.

When the blood or C.S.F. reaction is positive in late syphilis the treatment is that of tertiary syphilis ; indeed, when the C.S.F. is positive, treatment is very energetically carried out, and for a longer period than in the case when the blood only is positive.

When the blood and C.S.F. are negative in late syphilis, if preceded by *sufficient* treatment, one or, better still, two provocative neo-salvarsan injections are given, after which the blood is examined several times, and, if possible, also the C.S.F. If the results are negative, further treatment is waived. If, however, in such cases a mild treatment has preceded, I should advise *one* energetic course of treatment.

In syphilis of pregnant women I lay great stress upon the advisability of the earliest possible treatment, and upon several courses of treatment during pregnancy, with short intervals, but with individual doses of less than normal strength, as women at this time are particularly susceptible, while the very greatest care is required for the tender foetal organism. Above all, attention must be given to the functioning of the kidneys, which are particularly easily damaged in these cases. For this reason I attach the greatest value to the salvarsan treatment, and am especially cautious in the use of bismuth and mercury.

In congenital syphilis the question arises as to whether, in the absence of clinical and serological symptoms, one ought to treat specifically the new-born babe. When syphilis has been discovered in the mother only a short time before, or at the birth, or, in other words, she has remained untreated during pregnancy, it is advisable to treat the child as if signs had already appeared, because untreated syphilitic women (that is to say if the syphilis is not of too long standing) generally bear children who, though they may at first appear to be free, almost invariably become ill from syphilis at a later date. (It ought to be insisted upon that those women who come under examination for pregnancy and delivery should submit to a serological examination.)

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If the mother is thoroughly treated during pregnancy the child need not be subjected to treatment, more especially if one has the certainty of being able to keep it under clinical and serological observation for a long time. If this, however, is not the case, it is much better to give such children at least one course of prophylactic treatment.

For the treatment of congenital syphilis in newly-born children, and in children in their first year, neo-salvarsan and bismuth are also the principal remedies used now. Formerly we used to give, besides neo-salvarsan, mercury in the form of a binder with grey plaster, rubbing with grey ointment, intramuscular injections of perchloride of mercury, of salicylate of mercury, or of calomel; more rarely, calomel or yellow iodide of mercury internally. We now give bismogenol (diluted to one in ten, in doses of 0.3 (*i.e.*, 0.03 bismogenol = 0.0002 Bi per kilogram). We like to begin with bismuth and to go on soon to neo-salvarsan. The latter is most frequently injected into the veins of the skull or, more rarely, into the jugular vein. For general practice, however (in the case of lack of experience), intramuscular injections of neo-salvarsan dissolved in the smallest volume ($\frac{1}{10}$ to $\frac{1}{4}$ c.c.) of sterilised, distilled water are recommended. These we gave until a short time ago in doses of 0.0075 to 0.01 per kgr. of the child's weight once every five to seven days; we now gradually increase these doses (after satisfactory results, particularly those of E. Müller) up to 0.02 per kgr.

The combined treatments are at first continued for eight to twelve weeks (about twelve neo-salvarsan and fifteen Bi injections). We then proceed on the same lines as in the case of acquired syphilis, that is, after six to eight weeks a second, equally strong course, and then several repeated courses according to the clinical and serological manifestations, but preferably for four years, with (if the findings are negative) gradually increasing intervals.

That the most careful attention should be given to the factor of nutrition is naturally just as important as that all congenital syphilitic children should be closely watched until they are past puberty.

In the treatment of congenital syphilis in children after the first year we follow the same principles, but always approaching more and more to the schemes and doses which have been given above for acquired syphilis.

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In congenital syphilis the C.S.F. must always be investigated, at the very least, before treatment is finally stopped.

In syphilis of the central nervous system I follow the same principles as those laid down for internal syphilis, but am particularly careful in the initial doses (because of the possible reaction), and I continue the treatment over a very long period, particularly in the meningeal forms. Repeated lumbar punctures seem greatly to stimulate the success of the specific treatment, especially as regards the subjective symptoms.

I have very rarely administered salvarsan spinally, and generally dispense with it in cases of syphilis.

With regard to tabes, I have only very insufficient experience. I treat it now with neo-salvarsan and bismuth, much as I do internal syphilis, but for a very long time, if tolerance permits for a period of many years. I constantly give iodine in large doses ; occasionally also Hg and fever-producing agents.

Paralysis is amongst my cases of too rare occurrence to allow of my having formulated any special views in regard to its treatment. I would treat it now with neo-salvarsan, bismuth and malaria.

In sero-resistant late syphilis it has also sometimes proved impossible for me to *make* the sero-reaction lastingly negative. While in early sero-resistant cases I concentrate entirely upon obtaining negative reactions, in late syphilis I give up specific treatment after three to four courses if the spinal fluid and the internal organs, particularly the aorta, appear to be healthy. Patients are then advised only to place themselves repeatedly under medical supervision over a period of many years. If, however, changes are found in the fluid, in the aorta, etc., the treatment is continued much longer, as in the case of tabes.

In these cases also the protoplasm-activating therapy, sweat-producing measures (also Zittmann), and malaria will be found useful.

B.—THE TREATMENT OF GONORRHŒA

GONORRHŒA IN MEN

I do not recommend any general treatment scheme in uncomplicated cases of gonorrhœa. I give this only

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where there are definite indications, as in acute posterior urethritis, hyper-acute urethritis, or where there are complications. For acute symptoms in the urinary tract I use, in addition to the balsams (copaiba, sandal-wood oil), the modern urinary antiseptics (urotropin, helmitol, neo-hexal, salol, methylene blue, etc.), and the infusions (especially *Folia Uvæ Ursi*). Also, I chiefly make use of the pain-relieving preparations (opiates, salicylates, especially aspirin, and anti-neuralgic remedies—pyramidon, antipyrin, phenacetin—which, in part, also act as antipyretics) and atropin or extract of belladonna. I have not been particularly convinced that the regular use of the last has prevented local complications (epididymitis).

Vaccines are not regularly used in treatment, but are used principally in complications. In general, I give one which is prepared in the laboratory of the clinic—a polyvalent gonococcal vaccine which (latterly made with the addition of especially virulent gonococcus stock) is greatly valued. For about a year we have often given auto-vaccines, but we cannot yet say with certainty that they afford better results. The gonococcal vaccine which we use contains 20, 50, 100, 500 million germs in the c.c. They have been made up at relatively short intervals, so that we have not noticed any especial diminution in the efficacy of the individual batches. Also Schering's preparation, made with urotropin, has been tried by us without any especial advantage being seen. We give the gonococcus vaccine almost exclusively by the intravenous route and in doses of 5 to 200, and perhaps to 500 millions. At times we also try inter-dermal applications. We regulate the doses according to the amount of feverish reaction. If this is low we increase the doses more quickly, and if it is high we remain at the same dose. In any case, we always try to excite reactions again and again. The intervals between the individual doses are generally in consequence two to five days—the reaction should have quite run its course before a new injection is given. We see so little of local reaction that we cannot use this as a guide. As a rule, we do not give with the vaccines any protein-shock remedies. We use the latter, however, in resistant cases and then employ milk, aolan, turpentine, and the like.

I begin at once with the local treatment except in the very rare cases of hyperacute infection, which we treat at

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first with poultices, rest in bed, etc., and internal remedies (see above). I employ injections with a syringe (of 15 c.c. capacity), with a conical or olive-shaped nozzle of ebonite. The medicaments which I use are, above all, silver combinations, viz., in acute cases: Ichthargan, 1/2,000 to 1/1,000; protargol, $\frac{1}{4}$ to 1 per cent.; albargin, 1/1,000 to 1/500; and later (though often also from the beginning), silver nitrate, 1/5,000 to 1/2,000. The injections are administered by the patient himself four to six times daily, for five to ten minutes each time, after the doctor has convinced himself that the patient is master of the technique. In very early cases, before the occurrence of the real inflammatory signs, I employ the "*abortive treatment*"—albargin, 1 to 2 per cent.; protargol, 4 per cent., with the addition of 2 per cent. alypin—mostly giving two sittings at a twelve-hours' interval. At each sitting are given two injections of three to five minutes' duration. After that, if the signs of irritation are not too severe, a few weaker injections are given within two to three days. Irrigations are applied when the patient injects himself with difficulty owing to an epi- or hypospadias, in all obstinate cases, and, above all, when patients have sufficient time to be able to have irrigations. By irrigations, when they are given as well as the injections (daily for preference), the course of gonorrhœa is appreciably shortened. I use for irrigations most frequently—mercury-oxycyanide, 1/8,000 to 1/4,000; less often, potassium permanganate, 1/10,000 to 1/2,000; and silver nitrate, 1/5,000 to 1/2,000. The irrigations are administered either by the doctor or by a specially-trained male nurse—only exceptionally capable patients do this for themselves.

In anterior urethritis the irrigation is limited as far as possible to the front part of the urethra; only after the establishment of a posterior urethritis is the whole urethra washed out. Besides the irrigator we make use of Janet's syringe, with an elastic catheter. Further, in acute posterior urethritis, we occasionally, with advantage, make use of injection into the posterior urethra (with Guyon's catheter and an ordinary syringe with a small conical nozzle) of 5 to 10 c.c. of $\frac{1}{2}$ to 2 per cent. silver-nitrate solution.

In chronic gonorrhœal urethritis, that is to say when gonococci are still demonstrable, the treatment is carried out with especial energy and consistency, using the same

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remedies and methods as in acute and sub-acute cases. The solutions I prefer in these cases are silver nitrate, up to 1/1,000; Liq. argentamini, 1/400 to 1/200, and stronger. As far as possible irrigations are always given besides injections. Very often, when infiltrates are verified with the olivary sound (bougie), but also without this, use is made of massage over a large bougie, or the heated sound, followed by an irrigation. In exceptionally resistant cases I use the flushing-dilatater. If a single infiltrate is found, I use for this a drop of 1 to 2 per cent. silver-nitrate solution deposited with a Guyon catheter. The experienced can undertake, in these cases, the local treatment with the urethroscope.

The examination is always extended to the *prostate* and *seminal vesicles*, and these must often be treated together with the urethritis. If a prostatic abscess is forming, then we order rest in bed, diet, hot applications to the rectum with the Arzberger's apparatus; hot fomentations to the perineum; hot sitz-baths; morphia, belladonna, ichthyol suppositories, and vaccine treatment; often also milk injections, etc., are employed. If in spite of this treatment the abscess can be felt fluctuating right under the mucous membrane, it is opened with a small incision in the rectum, through a rectal speculum. In the opening of the incision 1 to 2 per cent. silver-nitrate solution is repeatedly injected (using a Pravaz syringe, with or without a blunt cannula), and thin strips of gauze soaked in ichthyol or ichthargan solution are placed in the opening of the incision. The rectum is daily washed with 1 to 2 per cent. ichthargan solution to prevent a rectal gonorrhoea, and an ichthyol suppository is put in so that in most cases a rapid healing is brought about. If the abscess spreads towards the urethra, then it is best to catheterise with a Mercier's catheter; thereby it is not uncommonly made to perforate into the posterior urethra. We wash then daily with mercury oxycyanide solution, or inject with silver solution through a Guyon's catheter. If there is no rapid formation, or any quick evacuation, of an abscess in the direction of the urethra or rectum, and the swellings, fever, etc., do not subside, the surgeon must search out the abscess from the perineum, and evacuate it.

Prostatitis without abscess formation is treated, at the beginning, like posterior urethritis, with the addition of

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vaccine or protein-shock therapy. If there is no result, then we change over to regular (if possible daily) massage of the prostate, followed by irrigation, as also Guyon's installation, with the addition of ichthyol, iodine, or potassium iodide suppositories, hot sitz-baths and hot Arzberger irrigations.

A similar treatment is of value in *spermatocystitis*. In *epididymitis* the local treatment of the urethra is not omitted, just as it is not omitted in the non-abscess-forming prostatitis and spermatocystitis), except on the first days in quite exceptionally acute inflammation—in all severe cases of epididymitis rest in bed, mild diet, care for easy evacuation of the bowels, rest and elevation of the scrotum. Also local hot applications (hot linseed poultices, the thermophore, the electrically-heated pillow, with the least possible pressure on the inflamed organ), besides gonococcus vaccine, and perhaps also milk, aolan or turpentine injections. Sedative preparations (morphia, pyramidon, etc.) must be employed sometimes. In cases which are less acute, and in subacute and chronic cases, the treatment can be ambulatory. Under a very well-fitting (Neisser's) suspensory bandage is placed a dressing of ichthyol or liquor aluminii acetatis (with a waterproof covering), and fixed with cotton-wool plaster; this is renewed daily—preferably by the doctor or an experienced nurse. If the severer signs of inflammation have subsided, a moderately tight iodine lead plaster strapping can be applied. I consider surgical interference unnecessary except in rare cases where an abscess has formed. Otherwise I have noted no special success from this procedure, but puncture sometimes works well in easing pain.

In *arthritis*, *teno-synovitis*, *bursitis*, besides rest in bed, a light compressed dressing with ichthyol, salicyl-vaseline, mesotan, iodine or potassium iodide ointment and hot baths (local and general). I employ active and passive movements as early as possible to prevent ankylosis, hot poultices, hot-air applications, diathermy, vaccine therapy, as also aolan and turpentine injections and, occasionally, intravenous collargol, electrargol or argochrom injections. At a later date, fango, hot sand baths and systematic mechano-therapy. Of internal remedies, apart from analgesic ones, I prefer chiefly atophan. Surgical interference is mostly superfluous.

The treatment of gonorrhœa in men should not be

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stopped too soon. Only when gonococci have not been found for two to three weeks, and in chronic cases after a substantially longer time, can one reduce the strength and frequency of the injections. If then the result still remains negative, one can suspend local measures.

To verify the cure we next take the morning secretion, searching microscopically the material scraped from the urethral wall, and the threads in the morning urine daily, if possible. It is best to examine separately the urine from the anterior and from the posterior urethra. These examinations are carried out for eight to fourteen days, during which the prostatic secretion is examined often, and that of the seminal vesicles at least once. If, during this time, neither a clinical relapse nor a gonococcus appears, then a provocative test is taken. For the first sitting I prefer the mechanical method, viz., expression of the urethral glands over a bougie with a large olive or cone-shaped head, or over a thick metal sound, and also the application of a "hot sound." If the microscopical preparations remain gonococcus-free for several days, then, especially in those cases which were not treated with vaccine, this is injected up to from 10 to 20 millions, after which more examinations are made. Finally, one can also try chemical provocation (injection of Liq. argentamini or of 1/400 Lugol's solution—iodine, 0.4 to 0.8; potassium iodide, 1.0 to 2.0; distilled water, 100.0).

In acute and subacute gonorrhœa, recrudescences come to light chiefly in the first week after the end of the treatment and before the use of a provocative. In my opinion, no case of gonorrhœa should be declared healed until four weeks after the end of treatment even when the provocative tests give negative results. When we have to consider inflammatory signs (post-gonorrhœal urethritis and prostatitis), so much the longer and more careful must the examination naturally be. If it gives, however, truly negative results to all tests, then the cure of the infectious process can be declared despite the presence of pus cells in the secretion. In the clinic and in all important cases in clinic ambulatory practice, especially for consent for marriage, we make use also of cultures of the gonococcus in order to make certain of the cure. In this, a few days after the end of the treatment, we cultivate the urethral secretion, threads, secretions of the prostate

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and the seminal vesicles, perhaps also the semen. These are repeated after the provocation. The number of cases which have been shown to be infectious only through culture has up to now not been considerable. We also make use of the complement fixation test, but up to now we cannot depend on this for making it a certain test of the cure.

GONORRHOEA IN WOMEN

For the treatment of gonorrhœa in women the same principles, in general, hold good as in men ; but these are naturally more difficult to carry out. We give internal remedies in uncomplicated cases (urethritis and cervical gonorrhœa), just as little as we employ vaccine and "protein shock" therapy, but we make use of the two latter in all complications and often also in uterine gonorrhœa. In acute cases of urethral and cervical gonorrhœa we abstain from local treatment so long as the symptoms and signs are very acute, and we confine ourselves to rest in bed, hot sitz-baths, hot irrigations with weak lactic acid and the like ; tamponage with protargol or ichthyol ointment ; laxatives ; powdering the vulva with dermatol, etc. ; poultices with liquor aluminii acetici, and painting of the vulva and vagina with $\frac{1}{2}$ to 1 per cent. silver nitrate solution. After the disappearance of acute symptoms, the urethra is treated one to three times daily with injections of 1 to 2 per cent. silver nitrate solution, using the same syringe as in urethral gonorrhœa of the man (many women easily learn to inject themselves), after the patient has urinated ; after this the urine is held in as long as possible. Besides injections we make use of protargol and similar bougies. In resistant cases we search out passages with the urethroscope (employing electrolysis and silver injections). In acute *Bartholinitis*, rest in bed, hot poultices. In Bartholin's abscess a small incision, and injection of 1 or 2 per cent. silver-nitrate solution into the opening of the abscess. In pseudo-abscess there is often spontaneous healing under expectant treatment. In sub-acute and chronic catarrh of Bartholin's duct, injection of 1 to 2 per cent. silver-nitrate solution into the canal, with a slightly bent and finest possible olivary cannula ; if this does not succeed we can also try injection with alcohol, protargol, etc., into the glands and their sur-

GONORRHŒA AND SYPHILIS

roundings ; otherwise extirpation of the gland with its duct is indicated. Extra-urethral foci are carefully destroyed by electrolysis, the galvano cautery, or injection with a strong silver solution.

Gonorrhœal Vaginitis—rare in a grown-up woman—heals most quickly under irrigation with ichthargan, painting with silver nitrate, ichthyol or protargol tamponage.

Gonorrhœa in children (vulvovaginitis) is very difficult to cure.

Gonorrhœa of the cervical canal can be treated in nullipara, without entering the *corpus uteri*, by daily thorough painting with silver nitrate (1 to 10 per cent.), tincture of iodine, jothion, formalin, etc., Sânger's or Menge's bougies, or with the Playfair's sound (after careful cleansing of the *portio*, as well as vaginal irrigation and protargol or ichthyol tampons as above). In place of this, or after it, bougies are employed as in the urethra.

If this treatment is without result after a long time (as in women who have had children and also before this) the endometrium of the body of the uterus is also treated by the same methods, or with very careful injection of several drops of the solutions mentioned, using Braun's syringe or the Guyon catheter. In *acute gonorrhœa* of the *adnexa* the same methods are applied, such as rest, hot irrigation, sitz-baths, vaccine, etc. In chronic gonorrhœa of the *adnexa* the same treatment, and if rest is necessary care by the gynæcologist.

Rectal gonorrhœa, which is frequent in women, must be treated with ichthargan, protargol, etc., irrigations, with ichthyol suppositories, and perhaps also painting out through a rectal speculum. During the course of gonorrhœa in women—even in the chronic stages—rest should as far as possible be secured and sexual intercourse avoided, as also stimulation of the breast. All local treatment is naturally stopped during menstruation, and particularly at these times must women keep quiet.

The determination of the cure is particularly difficult and should be carried out very carefully. After every menstruation every part is most carefully searched for gonococci. After the first menstruation the treatment should not be suspended even after a negative result. If gonococci remain absent after the second or third menstruation, then one can proceed to skilful provocation with Lugol's solution, gonococcal vaccine, etc. But one can

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never declare as free from the danger of infection any one who has suffered from gonorrhœa until examinations after three or four menstruations have proved negative. Also in women one can naturally make use of cultural methods to make more sure of the findings.